WEST MOUNTAIN RADIO

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Thank you for choosing the PWRguard PLUS from West Mountain Radio. This product is designed to protect your 12VDC equipment and battery against system power faults. An optional external sense input is available on PWRguard PLUS for further protection of your equipment.

The method of operation is to disconnect the load if the supply voltage is outside the normal range (11.0V to 15.0V) or the external sense input is activated. The sense input can be triggered from an external dry contact closure or a low voltage input (3.0 to 5.0VDC). One example would be connecting a sensor that detects water in a basement, and PWRguard PLUS would shut down power. Another useful example is to have a sense input connected to a key switch to enable power from PWRguard PLUS.

The PWRguard PLUS also has a piezo buzzer alarm which will sound once per minute during load disconnect. This alarm can be disabled if you do not need an audible alert.

Modes of Operation: Automatic and Manual

Automatic Mode

Supply Voltage Not In Normal Range: When the supply voltage is outside of the normal range the PWRguard PLUS will disconnect the load. Upon restoration of normal supply voltage the load will be reconnected automatically.

Sense Input Triggered: When the sense input is activated the PWRguard PLUS will disconnect the load. When the sense condition is cleared the PWRguard PLUS will automatically reconnect the load unless supply voltage is outside of normal levels.

Manual Mode

Supply Voltage Not In Normal Range: When the supply voltage is outside of the normal range the PWRguard PLUS will disconnect the load (as above) and permit a manual reset only when the power is within the normal voltage range.

Sense Input Triggered: When the sense input is activated the PWRguard PLUS will disconnect the load. When the sense condition is cleared the PWRguard PLUS will automatically reconnect the load unless supply voltage is outside of normal levels.

Installation

1. Install the PWRguard PLUS between the power source and the loads to be protected.

   NOTE: The unit comes fitted with Powerpole connectors for ease of installation into your power system.
   Input (power source) connects on the left side of the case.
   Output (load) connects on the right side of the case.
   Make sure that you only connect the RED lead to POSITIVE, and the BLACK lead to NEGATIVE.

2. Install the unit in a cool dry location. The case may be fastened down using the mounting holes on the flanges.

3. The external sense terminal is located within the unit. Remove the case and locate the small terminal-block on the left hand side. The terminal nearest the edge of the board provides +5VDC through a 330 ohm resistor and the right terminal is the sense input.

   The piezo buzzer alarm can be disabled by removing the jumper from the terminal post marked “Buzzer”.

4. When the power supply is switched on, the PWRguard Plus unit will become operational and the AUTO RESET and ON LEDs will both glow green. If the AUTO RESET LED does not turn on, hold the reset button down for 5 seconds until it does. If the YELLOW LED (Low fault) comes on instead of the ON LED, it means that your power supply or battery voltage is too low. PWRguard Plus requires at least 13.5 volts to become operational when turned on.

   This setup integrates PWRguard Plus into a UPS. The PWRGuard Plus input is connected to the output of the Super PWRgate. The PWRguard Plus output is connected to the input of the RIGrunner. This setup will protect the battery from deep discharge after an AC power loss, and all devices that are plugged into the RIGrunner from under and over voltage. After AC power is restored, the battery will be recharged through the Super PWRgate and PWRguard Plus will reset the system.

Integrated Set Up

This set-up connects PWRguard PLUS input to the Super PWRgate PG40S output terminal and then plug the PWRguard PLUS output into the RIGrunner input terminal. This will provide protection for the battery and all the devices that are plugged into the RIGrunner. Additionally, after loss of AC mains power, the PWRguard PLUS will reset the system after the power is restored.

Fuse
The PWRguard PLUS fuse is used to protect the source and the load from excessive current. The PWRguard PLUS includes a 40A fuse (the rating of the PWRguard PLUS.) The fuse may be changed to a lower value if desired for protection of other system components downstream.

Operating In Automatic Reset Mode
The PWRguard PLUS unit is operational whenever it is connected to the 12V power source. There is no ON/OFF switch needed. This is the Factory Default Mode Setting.

GREEN LED – Output ON	When the source voltage is between 11.0 and 15.0V (nominally 13.8V), the large green LED will light showing that the output is ON. The small LED indicates the PWRguard PLUS is in Automatic Reset Mode.
RED LED – Hi-Fault	The RED LED (Hi-Fault) will light whenever the input voltage exceeds 15V. The GREEN LED will go OFF and there will be NO output voltage. In the automatic reset mode, the RED LED will turn off when the input voltage returns to less than 15V, and the output will turn ON, thereby relighting the GREEN LED and re-powering the load.
YELLOW LED– Low-Fault	The YELLOW LED (low-fault) will light whenever the input voltage drops below 11.0V. This LED will also briefly light if there are momentary dips below 11.0V. This feature assures correct operation during turn-on surge currents and during SSB or CW transmission when powered from a battery supply. The voltage may drop each time the power requirement peaks. If the voltage continues to be below 11.0V for more than 5 seconds, the LED will light continuously. This state will continue until the voltage is continuously below 11.0V and indicates the battery is nearing its drained state. The GREEN LED will go OFF, thereby turning the output OFF. The PWRguard PLUS will now remain OFF. When the input voltage returns to 13.0V, the PWRguard PLUS will automatically reset.

Operating In Manual Reset Mode
To configure this mode, hold the reset button down for 5 seconds and the small green “AUTO RESET” LED will go OFF.

Cold Start	The PWRguard PLUS will automatically reset from a cold start condition.
GREEN LED – Output ON	When the source voltage is between 11.0 and 15.0 Volts (nominally 13.8 volts), the large green LED will light showing that the output is ON. The small LED, being off, indicates the PWRguard PLUS is in Manual Reset Mode.
RED LED – Hi-Fault	The RED LED (Hi-Fault) will light whenever the input voltage exceeds 15.0V. The GREEN LED will go OFF and there will be NO output voltage. In the Manual Reset Mode when the input voltage returns to less than 15.0V, the RED LED will flash indicating a return to safe voltage condition. The PWRguard PLUS can then be manually Reset, thereby repowering the load and lighting the GREEN LED.
YELLOW LED – Low-Fault	The YELLOW LED (low-fault) will light whenever the input voltage drops below 11.0V. This LED will also light briefly if there are momentary dips below 11.0V. This feature assures correct operation during turn-on surge currents and during SSB or CW transmission when powered from a battery supply. The voltage may drop each time the power requirement peaks. If the voltage continues to be below 11.0V for more than 5 seconds, the Yellow LED will light continuously. This state will continue if the voltage is continuously below 11.0V and the battery is nearing its drained state. The GREEN LED will go OFF thereby turning the output OFF. The PWRguard PLUS will remain OFF. When the input voltage returns to 13.0V, the YELLOW LED will begin to flash indicating the supply voltage has recovered. The PWRguard PLUS can then be Manually Reset, thereby, relighting the GREEN LED and re-powering the load.
Manual to Auto Reset	To restore auto mode, hold the reset button down again for 5 seconds. The small green LED will light.

Additional Modes

Automatic Battery Save Mode
The PWRguard PLUS is designed to protect a battery from any additional current drain following a long turn off period of 60 minutes. This “Sleep Mode” will further reduce battery power drain by limiting the on time of the Yellow LED. Normal operation will be restored when the input voltage returns to the safe operating range, and the unit is manually or automatically reset. When the unit is in Sleep Mode there is very limited power drain.

Voltage Sensing Circuits
Units are factory calibrated for the specified trip points and delays.

Contact West Mountain Radio to have units programmed for special applications.

LED Indicators

Green	ON – Load powered OFF – Load off
Red	ON – Voltage too high Blink – Voltage good – waiting for reset
Yellow	ON – Voltage too low Blink – Voltage good – waiting for reset Short Interval Blink – Battery Save Mode

Specifications

Electronics	Maximum voltage: 35 VDC Current: < 30 mA Normal Mode < 5mA Sleep Mode
Solid State Switch	Continuous Current: 30 A Maximum Current: 40 A Nominal ON resistance: 5 milliohms
Switching Ranges	Hi Trip: 15.0 ± 0.1VDC Low Trip: 11.0 ± 0.1VDC Auto Re-Start: 13.0 ± 0.1VDC
Switching Time-Constants	Hi-Trip: 10 milli-seconds Low-Trip: 3.3 Seconds Mode Select: 5.0 Seconds Sleep Mode: 60 Min

Warranty

PWRguard Plus is warranted against failure due to defects in workmanship or materials for one year after the date of purchase from West Mountain Radio. Warranty does not cover damage caused by abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation, alternation, lightning, or other incidence of excessive voltage or current. If failure occurs within this period, return the PWRguard Plus or accessory to West Mountain Radio at your shipping expense. Repaired or replaced items are warranted for the remainder of the original warranty period. You will be charged for repair of replacement of the Pwrguard+ or accessory made after the expiration of the warranty period.

West Mountain Radio shall have no liability to customer or any other person or entity with respect to any liability, loss or damage caused directly or indirectly by use of performance of the products or arising out of any breach of this warranty, including, by not limited to, any damages resulting from inconvenience, loss of time, data, property revenue, or profit, or any direct, special incidental, or consequential damages, even if West Mountain Radio has been advised of such damages.

Except as provided herein, West Mountain made no express warranties and any implied warranties, including fitness for a particular purpose, are limited in duration to the state duration provided herein.

FCC INFORMATION

For a Class B digital device or peripheral, the user instructions shall include the follow-
ling or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection again harmful interference in a residential installation. This equipment generates,uses and can radiate radio frequency energy, and if not installed and used in accordance with the guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- •Reorient or relocate the receiving antenna
- •Increase the separation between the equipment and receiver
- •Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- •Consult the dealer or an experienced radio/TV technician for help.

Modifications not expressly approved by the manufacturer could void the user's authority to operated equipment under the FCC Rules.

Federal Communications Commission